DS-01025
(New)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS

FOR

COLORED SEALER COATING FOR STRUCTURAL CONCRETE

Effective Date
July 15, 2003

THE STANDARD SPECIFICATIONS, SERIES 2001, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

01025.01 MATERIALS.

The concrete surfaces of the bridge as designated in the plans shall be finished with a colored high silicone-content acrylic concrete sealer coating. Product used shall be one of the following, or approved equal:

Sherwin-Williams SWD DOT Bridge and Highway Sealer B-97 Series
The Sherwin-Williams Company
10132 Buxton
Houston, TX 77017
281-615-7571

Anvil Siliconized Acrylic Concrete Opaque Sealer
Anvil Paints and Coatings
1255 Starkey Road
Largo, FL 33771
800-822-6776

Advanced Concrete Stain Pigmented Sealer
Advanced Surfaces Inc.
2000 Banks Road
Margate, FL 33063
954-973-4528

Alternate products and suppliers are to be submitted to the Engineer for approval prior to material acquisition and application.

Refer to the bridge plans for specified coating colors and locations. The Contractor shall submit product specification sheets and coated concrete samples to the Iowa Department of Transportation, Office of Bridges and Structures, Ames, Iowa, for approval prior to application. Samples for each coating color

shall be concrete of the same mix design to be used for actual construction, 1 foot square by 2 inches thick (300 mm square by 50 mm thick), prepared according to the guidelines described in this Developmental Specification, and coated on the formed face only.

The following guidelines are in addition to the manufacturer's product recommendations. In no case should the manufacturer's recommendations be violated. It is required that an applicator with three or more years of experience applying similar coatings to concrete surfaces apply the product, and that a product manufacturer's representative be on site during initial surface preparation and product application. It is also required that a 3 foot by 3 foot (1 m by 1 m) test section be reviewed and approved by the Engineer before continuing with final product application.

01025.02 CONSTRUCTION.

A. Pre- application surface preparation.

All new concrete surfaces to receive the colored sealer coating are to be given a class 2 strip down surface finish per Article 2403.21, B, of the Standard Specifications.

New concrete must be cured for a minimum of 14 days and pass the ph, water penetration, and moisture content tests described in this Developmental Specification.

It is recommended that curing compounds used on slip formed concrete barrier rails be approved by the concrete sealer manufacturer for over-coating with the concrete sealer. Curing compounds containing paraffin shall not be used. Any curing compounds not approved by the concrete sealer manufacturer must be thoroughly removed prior to final coating application.

A concrete etching solution conforming to the concrete sealer manufacturer's recommendations shall be used on surfaces of slip formed barrier rails less than 3 months old. The etching solution application shall yield an open, porous surface for proper adhesion of the concrete sealer coating.

All surfaces must be clean, dry, and free of grease, oil, paint, curing compounds not approved for overcoating by the sealer coating manufacturer, concrete sealers, or any other material that would prevent a stable bond between the concrete sealer coating and the concrete surface.

1. Surface cleaning, at a minimum, requires the use of 3,000 psi (20 MPa) high-pressure washing at a flow rate of 3 to 14 gallons (11 to 53 L) per minute. Allow to dry for a minimum of 24 hours prior to coating application.
2. If the concrete cannot be cleaned adequately with a water wash, combined sand-and-water-blasting or light sandblasting (brush blast) shall be used.
3. In all cases the public, bridge, and all surfaces should be protected from harm during the cleaning process.

B. Pre- application surface tests.

Prior to the commencement of any coating, the concrete surfaces are to be checked by the Contractor for ph level and for the presence of sealers, oils, curing compounds not approved by the concrete sealer manufacturer, or other possible bond breakers; using the following methods and techniques:

1. Ph test.

Prepared concrete should have a ph level between 6 and 10. Perform ph test per ASTM D 4262 prior to coating surface. An acid-etch conforming to the coating product manufacturer's recommendations may be added to the water wash to reduce the ph. If acid-etch is used, surfaces must be rinsed prior to re-testing the ph level.

2. Water penetration test.

Dry concrete surfaces shall be tested for the presence of sealers, oils, curing compounds not approved by the concrete sealer manufacturer, etc. Both by visual inspection and by wetting with

fine mist water spray. Properly prepared, porous surfaces will show no water beading after 1 minute. If beading of water is apparent after 1 minute, surface must be cleaned of sealing agents. This may require further high-pressure washing, combined sand-and-water-blasting, or light sandblasting (brush blast). Portions of all surfaces designated to receive colored sealer coating shall be tested in different locations as directed by and to the satisfaction of the Engineer.

3. Moisture content test.
Testing for moisture content and readiness of the concrete surface to receive the coating shall be in accordance with ASTM E 1907. Acceptable test methods include electrical resistance or electrical impedance testing.

C. Product application.
A minimum of two coats shall be applied.

Apply under dry conditions only. Do not apply if rain is expected within 12 hours following application.

Air and surface temperature should be between 50°F and 90°F (10°C and 32°C) during and for 24 hours following application.

Do not over apply. Follow manufacturer's recommendations for coating thickness. No drips, runs, or sags will be allowed during the application or in the final results.

Stir product thoroughly before and during application.

The following application methods are allowed:

1. Brush: Use a natural bristle brush.
2. Roller: Use a 3/8 to 1/2 inch (9 to 13 mm) nap lambswool or other solvent-resistant cover.
3. Spray: Airless sprayer with a pressure of 1500 psi (10 MPa) and a 0.013 to 0.017 inch (0.3 to 0.4 mm) tip opening.

First coat: Apply first coat evenly, working in one direction. Allow at least 12 hours before applying the second coat. Do not overwork, as brushing or rolling back over partially dried material may cause lifting of the coating from the surface.

Second coat: For best coverage apply the second coat perpendicular to the first coat.

Third coat: Apply if needed to eliminate brush or roller marks that are evident in the finish. Apply in the same direction as the first coat.

Concrete areas adjacent to surfaces to receive the colored sealer coating shall be protected from any splash, staining, dripping, or over-rolling of the coating during application. Any coating material applied to surfaces not intended to receive the coating will be immediately and thoroughly removed to prevent staining.

01025.03 METHOD OF MEASUREMENT.

The quantity of Colored Sealer Coating for Structural Concrete, in square yards (square meters), will be the quantity shown in the contract.

01025.04 BASIS OF PAYMENT.

The Contractor will be paid the contract unit price per square yards (square meters) for the Colored Sealer Coating for Structural Concrete. This payment will be full compensation for furnishing all labor, equipment, and materials used to prepare, test, and apply all three coats, if needed, of the paint.